

management: "Do not struggle against the patients, just skip to the next step of the difficult airway management algorithm."¹⁷ Because of these standards, we did not measure intubation or apnea times. We thank Xue *et al.* for their pertinent propositions, some of them being currently applied for several years.

We have responded to three issues of Shetty *et al.* in our response to Xue *et al.* We have precisely defined exclusion/inclusion criteria including fiberoptic tracheal intubation indications in the methods section of our trial. There is no upper limit in the number of predictors to exclude the patient or to propose fiberoptically tracheal intubation.

The fourth issue from Shetty *et al.* deserves short explanations. The CL in the three patients intubated with the combination of the Airtraq® (Vygon, Ecoen, France) and GEB cannot be scored properly. In these patients the glottis was visible (CL = 1) but the larynx was sitting laterally far from the distal tip of the blade, and a long and narrow partially floppy epiglottis misdirected systematically the endotracheal tube into the pyriform fossae. We had observed that in two circumstances GEB dramatically shortened and simplified tracheal intubation with the Airtraq™ laryngoscope: in the presence of an abnormally distant larynx, the Sellick maneuver is applied. Then in these cases we use GEB to shorten tracheal intubation with the Airtraq™ laryngoscope. We have recorded videos of such maneuvers we could send to Shetty *et al.*

During this maneuver the Airtraq™ position is stabilized in optimal best position,¹⁵ the endotracheal tube is reamed in the channel (but not pushed) toward the glottis. GEB is passed through the endotracheal tube armed in the channel. Then manipulations of the distal tip of GEB in combination with soft changes in Airtraq™ position permits tracheal access and endotracheal tube railroading. We agree with Shetty *et al.* that we should have described this maneuver more extensively. We are ready to publish a case series demonstrating the value of GEB in case of difficult Airtraq™ intubation.

Gilles Dhonneur, M.D., Ph.D.,* Roland Amathieu, M.D., M.D., Xavier Combes, M.D. *Jean Verdier University Hospital of Paris, Paris, France. gilles.dhonneur@jvr.aphp.fr

References

- Amathieu R, Combes X, Abdi W, El Housseini LE, Rezzoug A, Dinca A, Slavov V, Bloc S, Dhonneur G: An algorithm for difficult airway management, modified for modern optical devices (Airtraq laryngoscope; LMA CTrach™): A 2-year prospective validation in patients for elective abdominal, gynecologic, and thyroid surgery. *ANESTHESIOLOGY* 2011; 114: 25-33
- Nishino T, Tagaito Y, Isono S: Cough and other reflexes on irritation of airway mucosa in man. *Pulm Pharmacol* 1996; 9:285-92
- Dhonneur G, Kirov K, Slavov V, Duvaldestin P: Effects of an intubating dose of succinylcholine and rocuronium on the larynx and diaphragm: An electromyographic study in humans. *ANESTHESIOLOGY* 1999; 90:951-5
- Combes X, Jabre P, Jbeili C, Leroux B, Bastuji-Garin S, Margenet A, Adnet F, Dhonneur G: Prehospital standardization of medical airway management: Incidence and risk factors of difficult airway. *Acad Emerg Med* 2006; 13:828-34
- Combes X, Jabre P, Margenet A, Merle JC, Leroux B, Dru M, Lecarpentier E, Dhonneur G: Unanticipated difficult airway management in the prehospital emergency setting: Prospective validation of an algorithm. *ANESTHESIOLOGY* 2011; 114:105-10
- Combes X, Le Roux B, Suen P, Dumerat M, Motamed C, Sauvat S, Duvaldestin P, Dhonneur G: Unanticipated difficult airway in anesthetized patients: Prospective validation of a management algorithm. *ANESTHESIOLOGY* 2004; 100:1146-50
- Jabre P, Combes X, Leroux B, Aaron E, Auger H, Margenet A, Dhonneur G: Use of gum elastic bougie for prehospital difficult intubation. *Am J Emerg Med* 2005; 23:552-5
- Combes X, Dumerat M, Dhonneur G: Emergency gum elastic bougie-assisted tracheal intubation in four patients with upper airway distortion. *Can J Anaesth* 2004; 51:1022-4
- Combes X, Sauvat S, Leroux B, Dumerat M, Sherrer E, Motamed C, Brain A, D'Honneur G: Intubating laryngeal mask airway in morbidly obese and lean patients: A comparative study. *ANESTHESIOLOGY* 2005; 102:1106-9
- Dhonneur G, Ndoko SK, Yavchitz A, Foucrier A, Fessenmeyer C, Polliand C, Combes X, Tual L: Tracheal intubation of morbidly obese patients: LMA CTrach vs direct laryngoscopy. *Br J Anaesth* 2006; 97:742-5
- Dhonneur G, Ndoko SK: Tracheal intubation with the LMA CTrach or direct laryngoscopy (letter). *Anesth Analg* 2007; 104:227
- Dhonneur G, Ndoko S, Amathieu R, Housseini LE, Poncelet C, Tual L: Tracheal intubation using the Airtraq in morbid obese patients undergoing emergency cesarean delivery. *ANESTHESIOLOGY* 2007; 106:629-30
- Dhonneur G, Ndoko SK, Amathieu R, Attias A, Housseini LE, Polliand C, Tual L: A comparison of two techniques for inserting the Airtraq laryngoscope in morbidly obese patients. *Anaesthesia* 2007; 62:774-7
- Ndoko SK, Amathieu R, Tual L, Polliand C, Kamoun W, El Housseini L, Champault G, Dhonneur G: Tracheal intubation of morbidly obese patients: A randomized trial comparing performance of Macintosh and Airtraq laryngoscopes. *Br J Anaesth* 2008; 100:263-8
- Dhonneur G, Abdi W, Amathieu R, Ndoko S, Tual L: Optimising tracheal intubation success rate using the Airtraq laryngoscope. *Anaesthesia* 2009; 64:315-9
- Dhonneur G, Abdi W, Ndoko SK, Amathieu R, Risk N, El Housseini L, Polliand C, Champault G, Combes X, Tual L: Video-assisted *versus* conventional tracheal intubation in morbidly obese patients. *Obes Surg* 2009; 19:1096-101
- Sudrial J, Birlouez C, Guillermin A-L, Sebbah J-L, Amathieu R, Dhonneur G: Difficult airway management algorithm in emergency medicine: Do not struggle against the patient, just skip to next step. *Emergency Medicine International* 2010; 8:26231

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Difficult Tracheal Intubation of In-hospital Emergent Patients

To the Editor:

In their recent article concerning airway outcomes and complications of in-hospital emergent tracheal intubations at a university hospital, Martin *et al.*¹ reported a difficult tracheal intuba-

This letter was sent to the author of the above-mentioned article. The author felt that a reply was not necessary.—James C. Eisenach, M.D., Editor-in-Chief

tion (DTI) rate of 10.3%. In this observational study, we noted that DTI was defined as Cormack and Lehane (C&L) grade III or IV laryngeal view, or three or more attempts by an anesthesiology provider. In the Practice Guidelines for Management of the Difficult Airway by the American Society for Anesthesiologists Task Force on Management of the Difficult Airway,² however, difficult laryngoscopy is described as not being able to visualize any portion of the glottis (*i.e.*, C&L grade III or IV) after multiple attempts at conventional laryngoscopy, whereas DTI is defined as when multiple attempts are required in the presence or absence of tracheal pathology.² According to the American Society for Anesthesiologists definitions, we consider that most DTIs reported in this study should be defined as difficult laryngoscopies, rather than real DTIs. Actually, in most patients with C&L grade III and IV laryngeal views, the authors had successfully completed the tracheal intubation using direct laryngoscopy with or without a gum elastic bougie. In contrast, 41 patients with C&L grade I and II laryngeal views experienced three or more intubation attempts. These results also suggest that the laryngeal view obtained by direct laryngoscopy is often used as a primary variable for DTI, but they are not synonymous in most patients.

In fact, ease or difficulty of the tracheal intubation depends more on the skill of an intubator than does laryngoscopy. For an experienced intubator, it may be difficult to obtain a good laryngeal view during direct laryngoscopy, but it is usually easy to insert the endotracheal tube when this laryngeal view is possible.^{3,4} That is, familiarity and ability of an intubator to cope with reduced laryngeal view using direct laryngoscopy can often decrease difficulty of the tracheal intubation. In addition, a main feature of direct laryngoscopy is that it provides an all-around view, making it particularly amenable to use with a gum elastic bougie. In clinical practice, the gum elastic bougie-guided intubation is most suitable for patients whose laryngeal aperture cannot be seen under direct laryngoscopy, *e.g.*, C&L grade III laryngeal view. Moreover, in most patients with a C&L grade III laryngeal view, the tracheal intubation can be successfully achieved with a gum elastic bougie at first attempt within a reasonable time period.⁵

In this study, all airway procedures were completed by a sophisticated in-hospital airway emergency response team, but it was not clear whether an optimal-best attempt at direct laryngoscopy had been required when assessing the laryngeal view with the C&L grading system in all patients. For studies of difficult laryngoscopy to be reliable and for the preceding laryngoscopic grading system to be helpful, the reported laryngeal view grades must describe the best views obtained by direct laryngoscopy, which, in turn, depends on the best possible performance of direct laryngoscopy. Except for a reasonably experienced intubator, an optimal-best attempt at direct laryngoscopy also requires an optimal “sniffing” posi-

tion, a properly functioning laryngoscope, and if necessary, optimal external laryngeal manipulation or backward, upward, rightward pressure.⁶ During direct laryngoscopy, a sniffing position is achieved by placing a pillow under the patient’s head to obtain a more adequate laryngeal view because it can align the oral, pharyngeal, and laryngeal axis into more of a straight line.⁷ Furthermore, a backward, upward, rightward pressure maneuver can frequently improve the direct laryngoscopic view by at least one entire grade.⁸ It is generally recommended that a backward, upward, rightward pressure maneuver should be an inherent part of direct laryngoscopy, and an instinctive reflex response to a poor laryngeal view by direct laryngoscopy. In addition, proper function of a direct laryngoscope is dependent on the use of a blade with an appropriate length.⁶ Our concern is that in this study, lack of requirements for an optimal-best attempt at direct laryngoscopy may have overestimated the incidence of difficult laryngoscopy of the in-hospital emergency patients.

In method, an important issue not stated by the authors is definition of failed intubation with direct laryngoscope, although some patients underwent the tracheal intubation using a light wand, a fiberoptic bronchoscope, and an indirect laryngoscope. Moreover, the authors did not provide the clear indications to apply the rescue airways such as the laryngeal mask airway (12 cases) and surgical airway (9 cases). In addition, it was not clear whether an endotracheal tube with a malleable stylet was used during the initial intubation attempt. Our experience suggests that in most patients with C&L grade II and III laryngeal views, the tracheal intubation can be successfully accomplished at the first attempt if the distal end of the endotracheal tube is appropriately curved by a malleable stylet.⁴ Thus, when speed of the tracheal intubation is important (as in a patient with a full stomach or chest compression), an endotracheal tube should always be equipped with a stylet.

Finally, other than complications reported in the results such as aspiration, esophageal intubation, dental injury, and pneumothorax, it might have been more informative to provide the incidences of desaturation and hypoxemia during airway management procedures in emergent patients.

Fu-Shan Xue, M.D.,* Xu Liao, M.D., Yu-Jing Yuan, M.D., Qiang Wang, M.D., Jian-Hua Liu, M.D. *Plastic Surgery Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, People’s Republic of China. fruitxue@yahoo.com.cn

References

1. Martin LD, Mhyre JM, Shanks AM, Tremper KK, Kheterpal S: 3,423 emergency tracheal intubations at a university hospital: Airway outcomes and complications. *ANESTHESIOLOGY* 2011; 114:42–8
2. American Society of Anesthesiologists Task Force on Management of the Difficult Airway: Practice guidelines for management of the difficult airway: An updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *ANESTHESIOLOGY* 2003; 98:1269–77

3. Asai T, Koga K, Vaughan RS: Respiratory complications associated with tracheal intubation and extubation. *Br J Anaesth* 1998; 80:767
4. Xue FS, Liao X, Li CW, Xu YC, Yang QY, Liu Y, Liu JH, Luo MP, Zhang YM: Clinical experience of airway management and tracheal intubation under general anesthesia in patients with scar contracture of the neck. *Chin Med J* 2008; 121:989-97
5. Gataure PS, Vaughan RS, Latta IP: Simulated difficult intubation. Comparison of the gum elastic bougie and the stylet. *Anaesthesia* 1996; 51:935-8
6. Hagberg CA, Benumof JL: The American Society of Anesthesiologists' management of difficult airway algorithm and explanation-analysis of the algorithm, *Benumof Airway Management*, 2nd edition. Edited by Hagberg CA. St. Louis, Mosby-Year Book, 2007, pp 245-6
7. Benumof JL: Difficult laryngoscopy: Obtaining the best view. *Can J Anaesth* 1994; 41:361-5
8. Benumof JL, Cooper SD: Quantitative improvement in laryngoscopic view by optimal external laryngeal manipulation. *J Clin Anesth* 1996; 8:136-40

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